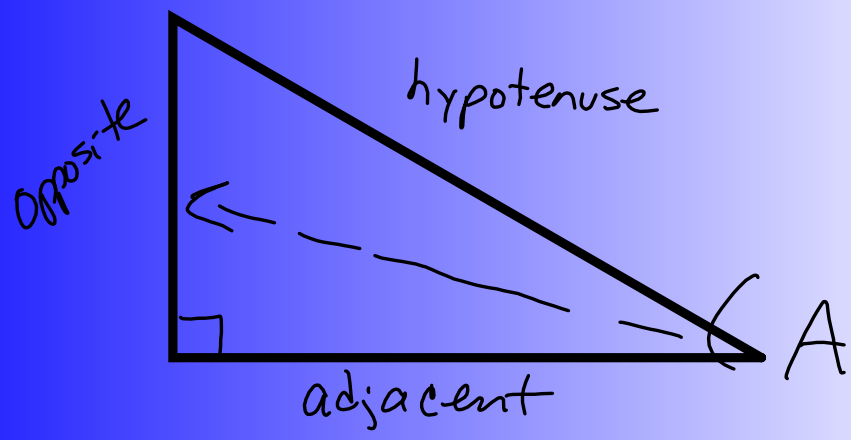
# Day 1: Right Triangles




Aug 8-8:59 PM

sin(A) = $\frac{\text{opposite}}{\text{hypotenuse}}$ cos(A) = $\frac{\text{adjacent}}{\text{hypotenuse}}$ tan(A) = $\frac{\text{opposite}}{\text{adjacent}}$

SOH CAH TOA

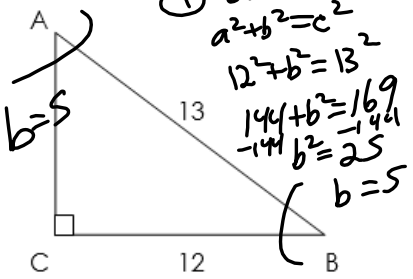
What mnemonic do you use?

Pythagorean theorem

$a^2 + b^2 = c^2$

legs hypotenuse

Pythag. Triple: 5, 12, 13




① $b =$

$a^2+b^2=c^2$

$12^2+b^2=13^2$

$144+b^2=169$

$-144 \quad -144$

$b^2=25$

$b=5$

$b=5$

$\sin(A) = \frac{O}{H} = \frac{12}{13}$

$\cos(A) = \frac{A}{H} = \frac{5}{13}$

$\tan(A) = \frac{O}{A} = \frac{12}{5}$

$\sin(B) = \frac{O}{H} = \frac{5}{13}$

$\cos(B) = \frac{A}{H} = \frac{12}{13}$

$\tan(B) = \frac{O}{A} = \frac{5}{12}$

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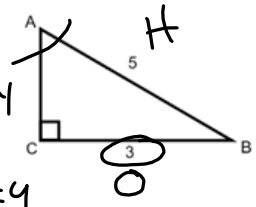
1. Find sin(A), cos(A), tan(A) and m∠A to nearest degree.




$a^2+b^2=c^2$

$3^2+b^2=5^2$

$9+b^2=25$

$b^2=16$

$b=4$

Pythagorean Triple

3-4-5

$\sin A=\frac{3}{5}$

$\cos A=\frac{4}{5}$

$\tan A=\frac{3}{4}$

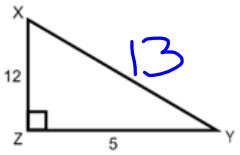
A 4 O

$\tan X=4$

$m\angle A=\sin^{-1}(3/5)=$ .92 / .64 $36.9^\circ \approx 37^\circ$

Calc: Degree mode

2. Find cos(X), sin(X), tan(Y) and m∠X to nearest degree.




$a^2+b^2=c^2$

$5^2+12^2=c^2$

$25+144=c^2$

$169=\sqrt{c^2}$

$c=13$

$\cos(X)=\frac{12}{13}$

$\sin(X)=\frac{5}{13}$

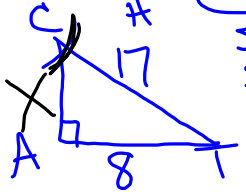
$\tan(Y)=\frac{12}{5}$

$m\angle X=\cos^{-1}\left(\frac{12}{13}\right)=23^\circ$

Aug 8-9:04 PM

3. Given △CAT with hypotenuse CT. The side opposite ∠C is 8 units long and the hypotenuse is 17 units long.

a. Find m∠C to nearest degree




$\sin C=\frac{O}{H}$

$\sin C=\frac{8}{17}$

$m\angle C=\sin^{-1}\left(\frac{8}{17}\right)$

$m\angle C=28^\circ$

b. Use m∠C to find side CA

$\cos 28^\circ=\frac{A}{H}$

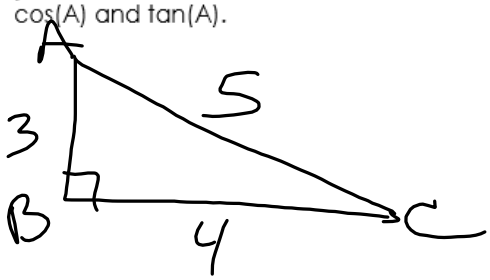
$\frac{\cos 28^\circ}{1}=\frac{x}{17}$

$x=17\cos 28^\circ=15.0101$

$=15$

try

4. Sketch triangle ABC, where angle B is the right angle and $\sin(A)=\frac{4}{5}$. Then find cos(A) and tan(A).




$\cos(A)=3/5$

$\tan(A)=4/3$

Triples

3-4-5

5-12-13

8-15-17

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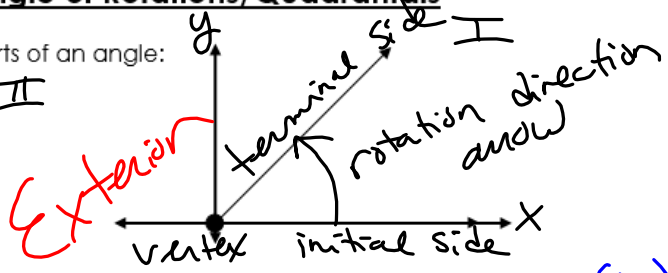
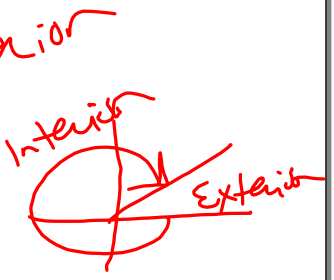
## Angle of Rotations/Quadrantals

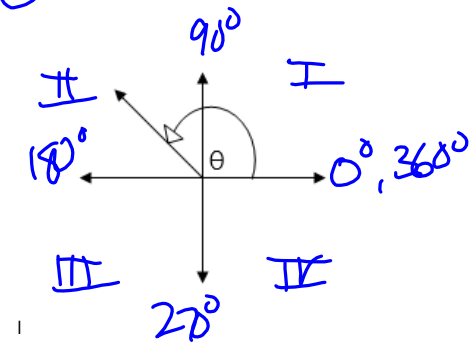
Parts of an angle:




Standard Position: The initial side of the angle is on the (+) x-axis

θ = Greek letter "theta" (a variable commonly used for angles)




Measures of ∠ θ in:

Quad I $0° < \theta < 90°$

Quad II $90° < \theta < 180°$

Quad III $180° < \theta < 270°$

Quad IV $270° < \theta < 360°$

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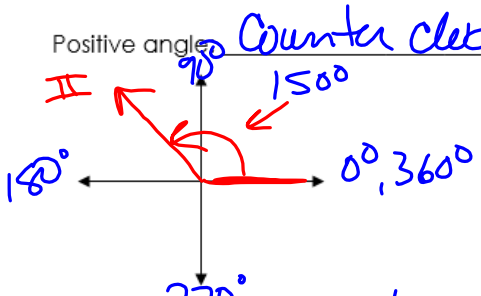
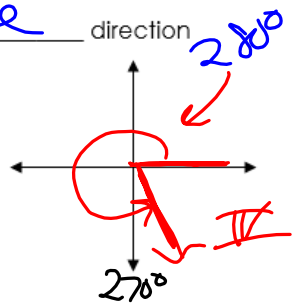
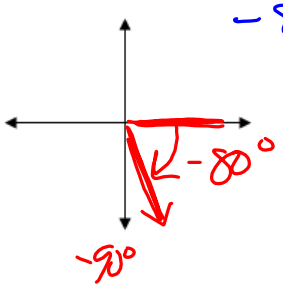
## Degree Measure

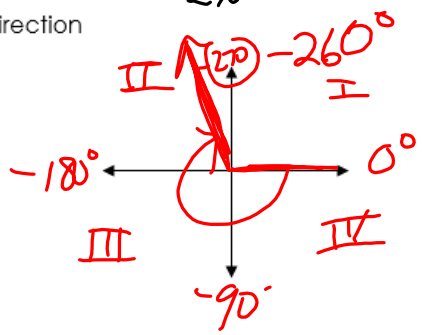
Positive angle: Counter clockwise direction




Negative angle: clockwise direction

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## Day 2 – Co-Terminal Angles, Quadrantals and the Unit Circle

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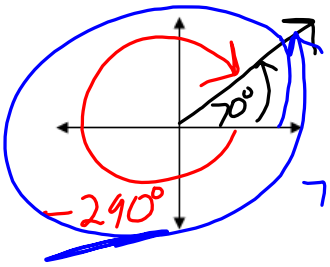
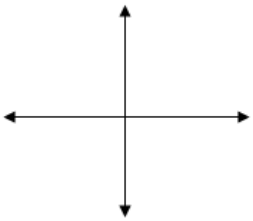
**Co-terminal Angles:** angles that share the same initial and terminal sides

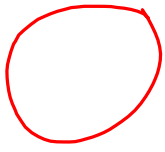
To find positive and negative co-terminal angles, add and subtract 360° to/from the angle. For example, two of the co-terminal angles for 70° are:




$70° + 360°$

$430°$






$70 - 360 = -290°$

$70 + 360 = 430°$

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